

**Listing of the Claims:**

The following is a complete listing of all the claims in the application, with an indication of the status of each:

Claims 1-22 (Canceled).

- 1       23. (Currently Amended) A method of outlier detection comprising:  
2           generating a plurality of synthesized data, each representing a randomly  
3       generated state within a given vector space, said generating including a random  
4       number generation;  
5           receiving a plurality of real sample data, each representing a detected real  
6       event as represented in said given vector space;  
7           forming a candidate sample set comprising a union of at least a part of  
8       said plurality of synthesized data and said plurality of real sample data, said  
9       candidate sample set having a starting population, said candidate sample set  
10      being unsupervised as to which members will be classified by said method as  
11      being outliers;  
12      generating a set of classifiers, each member of said set being a procedure  
13      or a representation for a function classifying an operand data as an outlier or a  
14      non-outlier, said generating a set of classifiers including:  
15          initializing said set of classifiers to be an empty set,  
16          selectively sampling said candidate sample data to form a learning  
17      data set, said selectively sampling including XX:XX  
18          i) applying said set of classifiers to each of said candidate  
19          sample data and, if any classifiers are extant in said set, generating  
20          a corresponding set of classification results,  
21          ii) identifying a consistency, for each of said candidate  
22          sample data, among said data's corresponding set of classification  
23          results.

24                    iii) calculating an uncertainty value for each of said candidate  
25                    sample data based on said identified consistency of said data's  
26                    corresponding set of classification results,  
27                    iv) ii) calculating a sampling probability value for each of said  
28                    candidate sample data based, at least in part, on the corresponding  
29                    uncertainty value based on said set of classification results, and  
30                    v) iii) sampling from said candidate data to form said learning  
31                    data set based, at least in part, on said sampling probability values,  
32                    such that said learning data set has a population substantially lower  
33                    than the starting population,  
34                    generating another classifier based on said learning data set,  
35                    updating said set of classifiers to include said another classifier,  
36                    and  
37                    repeating said selectively sampling, said generating another  
38                    classifier, and said updating until said set of classifiers includes at least  $t$   
39                    members; and  
40                    generating an outlier detection algorithm based, at least in part, on at least  
41                    one of said another classifiers, for classifying a datum as being an outlier or a  
42                    non-outlier.

1        24. (Currently Amended) The method of claim 23, further comprising:  
2                    receiving a given mis-classifying mis-characterizing cost data associated  
3                    with at least one of said synthesized samples, representing a cost of said outlier  
4                    detection algorithm mis-classifying mis-characterizing said at least one  
5                    synthesized sample as a non-outlier.

1        25. (Currently Amended) The method of claim 24, wherein said constructing said  
2                    learning data set from said candidate sample data is further based on said mis-  
3                    classifying mis-characterizing cost

1 26. (Currently Amended) The method of claim 23, wherein said ~~calculating a~~  
2 ~~sampling probability value includes identifying a consistency within said set of~~  
3 ~~classification results and~~ calculating a probability of said identified consistency  
4 uses using a Binomial probability function.

1 27. (Currently Amended) The method of claim 23, wherein said ~~calculating a~~  
2 ~~sampling probability value includes identifying a consistency within said set of~~  
3 ~~classification results and~~ calculating a probability of said identified consistency  
4 uses using a Gaussian probability function.

1 28. (Currently Amended) The method of claim 23, said ~~machine-readable code~~  
2 ~~for generating synthesized data~~ generates said synthesized data in accordance  
3 with a given statistical likelihood of said generated data meeting an outlier  
4 criterion.

1 29. (Previously Presented) The method of claim 23, wherein said generating an  
2 outlier detection algorithm generates the outlier detection algorithm such that  
3 said algorithm applies an aggregate of members of said set of classification  
4 algorithms, calculates a corresponding set of detection result data representing  
5 each of said aggregate's member's classification, and applies a voting scheme to  
6 said corresponding set of detection result data.

1 30. (Currently Amended) The method of claim 23, wherein said ~~calculating of~~  
2 ~~said uncertainty value includes identifying a consistency among said set of~~  
3 ~~classification results, and~~ calculating a probability of said consistency assumes,  
4 assuming each classification result within said set has a 50-50 probability of  
5 representing an operand as meeting an outlier said alarm criterion, statistically  
6 independent of said operand and of all other classification results within said set.

1 31. (Currently Amended) The method of claim 30, wherein said ~~calculating a~~  
2 ~~sampling probability value further includes~~ calculating a probability of said  
3 identified consistency uses using a Binomial probability function.

1 32. (Currently Amended) The method of claim 30, wherein said ~~calculating a~~  
2 ~~sampling probability value further includes~~ calculating a probability of said  
3 identified consistency uses using a Gaussian probability function.

1 33. (Currently Amended) The method of claim 28, wherein said ~~calculating of~~  
2 ~~said uncertainty value includes identifying a consistency among said~~  
3 ~~classification results, and~~ calculating a probability of said consistency, ~~assuming~~  
4 assumes each classification result within said set has a 50-50 probability of  
5 representing an operand as meeting said outlier ~~alarm~~ criteria, statistically  
6 independent of said operand and of all other classification results within said set.

1 34. (Currently Amended) The method of claim 33, wherein said ~~calculating a~~  
2 ~~sampling probability value further includes~~ calculating a probability of said  
3 identified consistency uses ~~using a~~ Binomial probability function.

1 35. (Currently Amended) The method of claim 33, wherein said ~~calculating a~~  
2 ~~sampling probability value further includes~~ calculating a probability of said  
3 identified consistency uses using a Gaussian function.

1 36. (Currently Amended) A system for classifying externally detected samples as  
2 one of at least normal and an outlier, comprising:

3 a machine controller having a readable storage medium;

4 a machine-readable program code, stored on the machine-readable  
5 storage medium, having instructions to:

6 generate a plurality of synthesized data, each representing a randomly  
7 generated state within a given vector space, said generating including generating  
8 a random number generation;

9 receive a plurality of real sample data, each representing an observed  
10 event as represented in said given vector space;  
11 form a candidate sample set comprising a union of at least a part of said  
12 plurality of synthesized data and said plurality of real sample data, said candidate  
13 sample set having a starting population;  
14 generate a set of classifiers, each member of said set being a procedure  
15 or a representation for a function classifying an operand data as ~~a rare event or~~  
16 an outlier or a non-outlier, said generating a set of classifiers including:  
17 initializing said set of classifiers to be an empty set,  
18 selectively sampling said candidate sample data to form a learning  
19 data set, said selectively sampling including XX:XX  
20 i) applying said set of classifiers to each of said candidate  
21 sample data and, if any classifiers are extant in said set, generating  
22 a corresponding set of classification results, and  
23 ii) identifying a consistency, for each of said candidate  
24 sample data, among said data's corresponding set of classification  
25 results,  
26 iii) calculating an uncertainty value for each of said candidate  
27 sample data based on said identified consistency of said data's  
28 corresponding set of classification results,  
29 iv) ii) calculating a sampling probability value for each of said  
30 candidate sample data based, at least in part, on the corresponding  
31 uncertainty value based on said set of classification results, and  
32 v) iii) sampling from said candidate data to form said learning  
33 data set based, at least in part, on said sampling probability values,  
34 such that said learning data set has a population substantially lower  
35 than the combined first and second population,  
36 generating another classifier based on said learning data set,  
37 updating said set of classifiers to include said another classifier,  
38 and

39 repeating said selectively sampling, said generating another  
40 classifier, and said updating until said set of classifiers includes at least  $t$   
41 members; and  
42 to generate an outlier detection algorithm based, at least in part, on  
43 at least one of said another classifiers, for classifying a datum as being an  
44 outlier or a non-outlier.

1 37. (Currently Amended) The method of claim 36, wherein said machine-  
2 readable program code further comprises instructions for:  
3 receiving a given mis-classifying mis-characterizing cost data associated  
4 with at least one of said example abnormal state data, said cost data  
5 representing a cost of said outlier detection algorithm mis-classifying mis-  
6 characterizing a data equal to said abnormal state data as not meeting an outlier  
7 said alarm criterion.

1 38. (Currently Amended) The system of claim 36, wherein said machine-readable  
2 code instructions constructing said learning data set from said candidate sample  
3 data include instructions for constructing said learning data based, at least in  
4 part, on said mis-classifying mis-characterizing cost.

1 39. (Currently Amended) The system of claim 36, wherein said machine-readable  
2 code instructions for calculating a sampling probability value include instructions  
3 for identifying a consistency within said set of classification results and  
4 calculating a probability of said identified consistency include instructions for  
5 calculating said probability using a Binomial probability function.

1 40. (Currently Amended) The system of claim 36, wherein said machine-readable  
2 code instructions for calculating a sampling probability value include instructions  
3 for identifying a consistency within said set of classification results and  
4 calculating a probability of said identified consistency include instructions for  
5 calculating said probability using a Gaussian probability function.

1 41. (Currently Amended) The system of claim 36, wherein said machine-readable  
2 code instructions for generating synthesized data include instruction for  
3 generating said data in accordance with a given statistical likelihood meeting an  
4 outlier criterion.

1 42. (Previously Presented) The system of claim 36, wherein said machine-  
2 readable code instructions for generating the outlier detection algorithm include  
3 instructions such that said algorithm applies an aggregate of members of said set  
4 of classification algorithms, calculates a corresponding set of detection result  
5 data representing each of said aggregate's member's classification, and applies  
6 a voting scheme to said corresponding set of detection result data.

1 43. (Currently Amended) The system of claim 36, wherein said machine-readable  
2 code instructions for calculating said uncertainty value include instructions for  
3 ~~identifying a consistency among said set of classification results, and calculating~~  
4 ~~a probability of said consistency, assuming that~~ assume each classification result  
5 within said set has a 50-50 probability of representing an operand as meeting an  
6 outlier ~~said alarm~~ criterion, statistically independent of said operand and of all  
7 other classification results within said set.

1 44. (Currently Amended) The system of claim 36, wherein said machine-readable  
2 code instructions for calculating ~~a sampling probability value include instructions~~  
3 ~~for calculating a probability of said identified consistency~~ include instructions for  
4 calculating said probability using a Binomial probability function.

1 45. (Currently Amended) The system of claim 36, wherein said machine-readable  
2 code instructions for calculating ~~a sampling probability value include instructions~~  
3 ~~for calculating a probability of said identified consistency~~ include instructions for  
4 calculating said probability using a Gaussian probability function.

1 46. (Currently Amended) The system of claim 41, wherein said machine-readable  
2 code instructions for calculating of said uncertainty value include instructions for  
3 ~~identifying a consistency among said set of classification results, and calculating~~  
4 ~~a probability of said consistency, assuming~~ that assume each classification result  
5 within said set has a 50-50 probability of representing an operand as meeting  
6 said outlier criterion ~~alarm criteria~~, statistically independent of said operand and  
7 of all other classification results within said set.

1 47. (Currently Amended) The system of claim 45, wherein said machine-readable  
2 code instructions for calculating a ~~sampling probability value include instructions~~  
3 ~~for calculating a probability of said identified consistency~~ include instructions for  
4 calculating said probability using a Binomial probability function.

1 48. (Currently Amended) The system of claim 45, wherein said machine-readable  
2 code instructions for calculating a ~~sampling probability value include instructions~~  
3 ~~for calculating a probability of said identified consistency~~ include instructions for  
4 calculating said probability using a Gaussian probability function.